



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/553,088	10/11/2005	Shigetoshi Miyama	10873.1773USWO	6631

52835 7590 02/22/2007  
HAMRE, SCHUMANN, MUELLER & LARSON, P.C.  
P.O. BOX 2902  
MINNEAPOLIS, MN 55402-0902

EXAMINER
----------

TOSCANO, ALICIA

ART UNIT	PAPER NUMBER
----------	--------------

1712

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/22/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/553,088

Applicant(s)

MIYAMA ET AL.

Examiner

Alicia M. Toscano

Art Unit

1712

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/24/07 1/9/06</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 17, 18, 22 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Otomo (JP 2003213122).

Otomo discloses PET resin compositions. Said compositions comprise 100 wt pts recycled PET, 3-60 wt parts polyolefin, 2-80 wt parts block copolymer and 150 wt parts olefin containing copolymer (abstract). The polyolefin may be a homopolymer of ethylene and the like [0019], the block copolymer may be a styrene-ethylene-propylene [0025], meeting the compatibilizer compositional requirements in applicants specification (pgs 9-10). It is the Examiners position that recycled PET resin inherently comprises water since it is washed prior to use [0018]. Predrying of the PET resin before kneading is not necessary, as stated by Otomo in [0018]. Kneading of all the components together is disclosed in [0037], thus all the limitations of Claims 1, 2, 3, 4, 5, 6, 7, 8 are met. The use of the 150 wt parts olefin containing copolymer meets the additive requirement of Claim 11. Other additives such as glass fibers, talc, mica, plasticizers, foaming agents and the like are disclosed in [0041], as required by Claims 9, 10 and 18. The composition, as discussed above, contains moisture prior to kneading, as required by Claim 12. It is the examiners position that since the recycled

Art Unit: 1712

PET of both Otomo and Applicants is obtained from recycling old beverage containers ([0018] of Otomo and pg 25, product A2 of Applicants) the moisture content of Otomo is inherently within the range required by Applicants Claim 13. The mixing sequence during kneading of the above components are not limited [0037], it is the Examiners position that the mixing sequence inherently refers to the addition of components while kneading, as required by Claim 15. Kneading occurs at a temperature of 150C+, thus the water in the resin is inherently heated to a temperature of 40C or more, as required by Claim 17. The composition and extruded product meet the requirements of Claims 22 and 25.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Art Unit: 1712

2. Claims 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otomo in view of Ohtomo (WO 2004/072158, US 2006/0255494 is used as an equivalent English translation of the world document).

Otomo includes elements of the invention as discussed above. Otomo does not include the use of kneading the composition while moisture is added to the composition.

Ohtomo discloses polymer composite material compositions. Ohtomo discloses the addition of an inorganic compound into a thermoplastic resin by dispersing the inorganic compound in water and kneading the two components together. This step may include kneading the thermoplastic resin first and thereby subsequently adding the water/inorganic compound to the kneading composition, ([0022], bottom ¼ of the column)), as required by Claim 14. By using the water/inorganic compound mixture, the inorganic compound can be finely dispersed in a resin resulting in a significant reinforcing effect [0003].

It would have been obvious to one of ordinary skill in the art at the time of the invention to include in Otomo, the addition during kneading of a water/inorganic compound mixture, as taught by Ohtomo, in order to significantly improve the reinforcing effect of the thermoplastic compound.

Claim 16 as written requires only a range from 0.01 to 20 parts by weight of moisture added. There is no rate required in said Claim. The weight ratio of lamellar inorganic compound to water is 1:0.2 to 1:100 [0018] and the amount of lamellar

Art Unit: 1712

inorganic compound added to the thermoplastic resin is 0.01 to 300 parts by weight [0020]. Said ranges encompass the adding amount of moisture required in Claim 16.

3. Claims 19, 21, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otomo in view of Taguchi (JP 2000-052408).

Otomo includes elements of the invention as discussed above. Otomo includes the use of a foaming agent and the use of moisture in his thermoplastic resin but does not disclose foaming by being kneaded in the presence of moisture, as required by Claim 19, the step of foaming by addition of a foaming agent after kneading, as required by Claim 21 or foam products, as required by Claims 23 and 24.

Taguchi discloses extruder and expansion molding methods for thermoplastic polyester resins. Said method includes utilizing carbon dioxide as a foaming agent and kneading the thermoplastic resin in an extruder (abstract). The extruder has separate sections 7 and 8 (see figure in abstract). Section 7 kneads only the thermoplastic resin and Section 8 kneads the thermoplastic resin with carbon dioxide in order to foam the resin (abstract). Foaming thermoplastics via this method uses lower pressure and less energy than typical foaming methods and also results in size uniformity within the cells of the foamed resin, yielding superior mechanical properties.

It would have been obvious to one of ordinary skill in the art at the time of the invention to include in Otomo the foaming method of foaming during kneading by the addition of a foaming agent after first kneading the thermoplastic alone, as taught by Taguchi, in order to reduce the cost of production while forming uniformly foamed

Art Unit: 1712

thermoplastic resins which have superior mechanical properties. Thus the requirements of Claims 19 and 21 are met by Otomo. Use of the foaming method to create foam sheet, film and the like is disclosed in [0035] as required by Claims 23 and 24.

4. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Otomo in view of Masadu (JP 2004-195685).

Otomo includes elements as discussed above. Otomo includes the use of a foaming agent but does not disclose methods of making a foamed product.

Masuda discloses methods for creating thermoplastic foamed sheets. Said method includes kneading the foaming agent with the thermoplastic resin and later foaming due to the pressure differential caused by extrusion of the highly pressurized resin into low (atmospheric) pressure (abstract). Said method results in fine diameter cells in the foam (abstract), resulting in superior mechanical properties.

It would have been obvious to one of ordinary skill in the art at the time of the invention to include in Otomo the use of foaming after kneading, as taught by Masadu, in order to create a foam with fine particle diameter cells, yielding a product with superior mechanical properties.

### ***Conclusion***

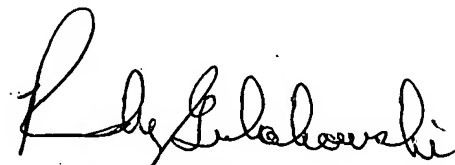
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alicia M. Toscano whose telephone number is 571-272-2451. The examiner can normally be reached on Monday to Friday 8:30 AM to 5 PM.

Art Unit: 1712

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AMT

A handwritten signature in black ink, appearing to read "Randy Gulakowski", is positioned above the printed name and title.

RANDY GULAKOWSKI  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700